

REMARKS

I. Specification

The Examiner objected to the specification due to the following informalities:
Paragraphs are not numbered on pages 12 and 13.

The Applicant notes that the paragraphs on pages 12 and 13 have been amended to add paragraph numbers [0033] - [0036]. Additionally original paragraph number [0033] has been amended to be re-numbered as paragraph [0037] in response to this objection. Based on the foregoing, the Applicant respectfully requests that the objection to the specification be withdrawn.

II. Claim Rejections - 35 USC §112

The Examiner rejected claims 1, 11 and the subsequent dependent claims under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Examiner argued that the claims contain subject matter which was not described in the application in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The Examiner stated that the newly amended claim "transmitting light...directly through one or less element" cannot be found in the Applicant's disclosure. The Examiner stated that the Applicant claims "transmitting light with one or less element to said at least one other light sensor or with one or less turns at another reflection point from said at least one other light source directly through said one or less element to said at least one sensor wherein said one or less element comprises a mirror." The Examiner argued that Applicant's disclosure does not teach how light can be transmitted through a mirror.

The Applicant respectfully disagrees with this assessment and notes that claims 1 and 11 have been amended in response to these rejections. Claim 1 as amended is shown, for example following:

A method, comprising:

associating at least one light source and at least one light sensor with at least one component of a data-processing system;

associating at least one other light source and at least one other light sensor with at least one other component of said data-processing system; and

communicating data between said at least one component and said at least one other component of said data-processing system by transmitting light from said at least one light source to said at least one other light sensor and from said at least one other light source to said at least one sensor wherein said light travels either directly or is guided only by at least one mirror from said at least one light source to said at least one other light sensor and from said at least one other light source to said at least one light sensor.

The Applicant's invention transmits the light *either* directly from source to respective sensor or utilizes only at least one mirror to guide light from source to respective sensor. This is disclosed in the Applicant's FIG. 3 for the direct embodiment and in FIG. 4 for the mirror embodiment. This is further disclosed in the Applicant's paragraphs [0030] and [0031] as follows:

"[0030] FIG. 3 illustrates a block diagram of a light-based data communications system 300, which can be implemented in accordance with a preferred embodiment of the present invention. System 300 illustrates data-processing system components, which were also depicted in FIG. 2. Thus, in FIGS. 1-4, similar or identical parts or components are generally indicated by identical reference numerals. Thus, in the configuration of system 300, network interface 285 can be located opposite device controller 284. Network interface 285 is associated with a light source 314 and a light sensor 316, while device controller 284 is associated with a light sensor 346 and a light source 344. Light can be emitted by light source 314 and detected by light sensor 346. Similarly, light emitted from light source 344 can be detected by light sensor 316. *A direct light path can thus be established between light source 314 and light sensor 346. Similarly, a direct light path can also be established between light source 344 and light sensor 316. In the configuration of system 300, the light sources and light sensors are directly aligned, but can be separated by a convenient distance of less than inch to several feet, depending upon design considerations. In FIG. 3, arrow 360 represents a direct light path between light source 314 and light sensor 346, while arrow 362 represents a direct light path between light source 344 and light sensor 316.*

[0031] FIG. 4 illustrates a block diagram of a light-based data communications system 400, which can be implemented in accordance with an alternative embodiment of the present invention. In the configuration of system 400, network controller 288 is located generally perpendicular to device controller 284. Network controller 288 is associated with light source 348 and light sensor 350, while device controller 284 is associated with light sensor 346 and light source 344. Light can be emitted by light source 348 and detected by light sensor 346. Similarly, light emitted from light source 344 can be detected by light sensor 350. *In system 400, however, a mirror 402 can be provided to assist in guiding light from light source 348 to light sensor 346 and from light source 344 to light sensor 350. Mirror 402 permits a more convenient location of communication sub-assemblies. In FIG. 4, arrow 364 represents a light path between light source 348 and light sensor 346, while arrow 366 represents a light path between light source 344 and light sensor 350.*" (emphasis added)

These amendments clarify the structural distinctions of the present invention by claiming a method wherein the light is transmitted either directly or guided only by a mirror. The Applicant submits that claims 1 and 11 are enabled by the written description as shown in the above citations of the Applicant's specification. Based on the foregoing, the Applicant respectfully requests that the 35 U.S.C. §112, first paragraph, rejections of claims 1 and 11 be withdrawn.

The Examiner rejected claims 1, 11, 16 and the subsequent dependent claims under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. The Examiner argued that it is unclear what "directly through" mean in claim 1 and 11. The Examiner asked does it mean (1) the light passes through the mirror or does it mean (2) the light is transmitted directly through (via) the mirror. The Examiner stated that neither definition seems to make sense. The Examiner argued that in the Applicant's disclosure, the Applicant teaches a mirror guides the light and fails to teach how light is transmitted through a mirror therefore (1) does not seem reasonable. The Examiner argued that the second definition does not make sense since directly means from point to point without deviation; the light would not be transmitted directly to the sensor if a mirror guides the light, which deviates the course of the path.

Furthermore, the Examiner argued, it is understood that if the light is transmitted from light source directly to the sensor then there shouldn't be any turns. Applicant claims the data (in this case some type of modulated light) is directly transmitted with one or less turns. The Examiner argued that the light can only be directly transmitted (with no turns) or the light is indirectly transmitted (with one turn).

The Applicant respectfully disagrees with this assessment and notes that the argument presented above against the §112, first paragraph, rejections of claims 1 and 11 applies equally against the §112, second paragraph, rejections as the claims as amended are definite. The Applicant's invention transmits the light *either* directly from source to respective sensor or utilizes *only* at least one mirror to guide light from source to respective sensor.

Regarding claim 16, the Applicant respectfully disagrees with the Examiner's assessment. The Applicant submits that the claim 16 does not claim the limitation "directly through" a mirror as the Examiner submits. Claim 16 includes the limitation wherein the light is emitted *directly* from a *source* to a *mirror* and thence *directly* to a *sensor*. Furthermore, claim 16 does not claim that the light is transmitted directly from source to sensor *with a turn* as also submitted by the Examiner. The "mirror" clause in claim 16 is shown as follows:

"... at least one mirror located at an end of said at least one light path in order to guide light emitted directly from said at least one light source to said at least one mirror and thence directly to said at least one other light sensor and light emitted directly from said at least one other light source to said at least one mirror and thence directly to said at least one light sensor."

This limitation is disclosed in the Applicant's FIG. 4 and in paragraph [0031] as shown above in the argument against claims 1 and 11. The Applicant respectfully requests that the Examiner re-read claim 16 and note that the claimed limitations are described within the specification as stated above and do not include the limitations rejected by the Examiner.

Based on the foregoing, the Applicant respectfully requests that the 35 U.S.C. §112, second paragraph, rejections of claims 1, 11 and 16 be withdrawn.

III. Claim Rejections - 35 USC § 102

Requirements for *Prima Facie* Anticipation

A general definition of *prima facie* unpatentability is provided at 37 C.F.R.

§1.56(b)(2)(ii):

A *prima facie* case of unpatentability is established when the information *compels a conclusion* that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability. (*emphasis added*)

"Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundsciber Corp. v. United States*, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)), *cert. denied*, 469 U.S. 851 (1984). Thus, to anticipate the applicants' claims, the reference cited by the Examiner must disclose each element recited therein. "There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention." *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ 2d 1001, 1010 (Fed. Cir. 1991).

To overcome the anticipation rejection, the applicants need only demonstrate that not all elements of a *prima facie* case of anticipation have been met, *i.e.*, show that the reference cited by the Examiner fails to disclose every element in each of the applicants' claims. "If the examination at the initial state does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to

grant of the patent." *In re Oetiker*, 977 F.2d 1443, 24 USPQ 2d 1443, 1444 (Fed. Cir. 1992).

Ozeki et al.

The Examiner rejected claims 1, 2, 7, 11 and 12 under 35 U.S.C. §102(b) as being anticipated by Ozeki et al. (U.S. Patent No. 6,317,242), hereinafter referred to as "Ozeki".

Regarding claims 1 and 11, the Examiner argued that Ozeki discloses (the Examiner cited FIG. 1 of Ozeki) a method, comprising: associating at least one light source (42a) and at least one light sensor (42b) with at least one component (40) of a data processing system; at least one other light source (42a) and at least one other light sensor (42b) associated with at least one other component (40) of said data processing system; and wherein data is communicated directly between said at least one component and said at least one other component of said data-processing system by transmitting light with one or less turns at a reflection point from said at least one light source directly through one or less element to said at least one other component of said data processing system by transmitting light from said at least one light source to said at least one other light sensor or one or less turns at a reflection point from said at least one other light source to said at least one sensor wherein said one or less element comprises a mirror. The Examiner argued that FIG. 1 shows the transmission of a signal with zero turns (which the Examiner argued anticipates one or less components) from the emitters to the receivers with zero elements (which the Examiner argued anticipates one or less components).

The Applicant respectfully disagrees with this assessment and notes that claims 1 and 11 have been amended to include the further limitation wherein said light travels either *directly* or is guided only by at least one *mirror* from said at least one light source to said at least one other light sensor and from said at least one other light source to said at least one light sensor.

As argued in the previous response, Ozeki does not disclose that the light transmission is *direct* from a light source to a light sensor or is guided only by at least one *mirror* and thence to a sensor. The Applicant notes that the independent claims include the limitation wherein the light sources and the sensors are *associated* with the *components* of the data-processing system. Therefore, the Applicant claims the light is transmitted either directly from one component to another or via a mirror which guides the light. The Applicant's FIGS. 2-4 indicate what a component could be defined as, for example, a network interface, device controller, CPU, etc.

Ozeki discloses an *optical bus* (see FIG. 1 of Ozeki) between a light source and a light sensor, each associated with a circuit board. . The transmission of light into an optical bus is not a direct transmission from source to sensor. Ozeki (col. 5, line 58 through col. 6, line 15) discloses that the optical bus includes input/output portions (reference item 21) and light input nodes A, B, C, D, E and F. The transmission of light *through* this bus does not constitute a *direct* transmission of light as in the Applicant's invention nor is the optical bus disclosed as a mirror to guide the light transmission. The light is transmitted into the optical bus from a circuit board utilizing *light input and output portions* and *light input nodes*. The light transmission in Ozeki is not a *direct* transmission to either the light sensor or to a mirror.

The Examiner has stated that Ozeki discloses a *direct* communication with a transmission of zero turns, however, the Examiner has admitted (page 4 of the current office action) that "directly" means without deviation. The Examiner's quote was "directly means from point to point without deviation". Ozeki discloses that the light enters an optical bus (i.e. a deviation) between the light source on the circuit board and the light sensor on another circuit board. How can Ozeki disclose a direct communication in view of this definition of directly? Ozeki discloses that this optical bus is *between* the source and sensor as disclosed in col. 4, lines 31-55 of Ozeki as follows:

"In carrying out the invention and according to one aspect thereof, there is provided a first optical bus system comprising: an optical bus system, comprising: an optical bus having a plurality of signal light input/output portions disposed along two opposed edges of said optical bus to input and output signal light, wherein the signal light input from said signal light input/output portions disposed at one of said edges thereof is transmitted toward the other edge thereof and is output from said signal light input/output portions disposed at the other edge thereof; and a plurality of light emitting/receiving circuits provided corresponding to said plurality of signal light input/output portions, wherein each of the light emitting/receiving circuit has a signal light emitting unit which generates the signal light entered into said optical bus through the corresponding signal light input/output portion and a signal light receiving unit which receives the signal light output from the corresponding signal light input/output portion to obtain a signal corresponding to the input signal at least one of the light receiving/emitting circuits corresponding to the plurality of signal light input/output portions on each of the two edges of the optical bus includes a repeater that causes the corresponding signal light sending unit to send out the signal light received by the corresponding signal light receiving unit."

Using the Examiner's own definition of *directly* excludes Ozeki from anticipation of the Applicant's claims as Ozeki does not disclose that the light is transmitted *directly* as disclosed in the Applicant's specification and claims. The Examiner has argued that the inclusion of an optical bus between the components is directly from one point to another as the Examiner has argued that there are no obstacles between the components. It is as if the Examiner has stated that the optical bus does not exist, i.e. it is not an obstacle. The Applicant asks: What is the optical bus in this case if *not* an obstacle between the components? What is the purpose of the Ozeki optical bus, if as the Examiner asserts, it performs no function in the Ozeki system as the Examiner argues it is *not* an obstacle?

The Examiner has argued that the Applicant's claims wherein a "direct" transmission of the light between components cannot include a light path to a mirror and then to a sensor, as this would not be "direct". The same logic must be applied in an assertion of a case of *prima facie* anticipation by the Ozeki reference. "Direct" must be from point to point *without* any intervening obstacles.

The Applicant's current amendment to claims 1 and 11 further clarifies this distinction of the light transmitted wherein said light travels either *directly* or is guided *only* by at least one *mirror* from said at least one light source to said at least one other light sensor and from said at least one other light source to said at least one light sensor. Ozeki does not disclose this claim limitation.

Therefore, Ozeki fails in the aforementioned *prima facie* anticipation test as Ozeki does not disclose each and every limitation of the Applicant's claims 1 and 11. Based on the foregoing, the Applicant respectfully requests that the 35 U.S.C. §102(b) rejections of claims 1 and 11 based on the Ozeki reference be withdrawn.

Regarding claims 2 and 12, the Examiner argued that Ozeki discloses (the Examiner cited FIG. 1) at least one light path patch established between said at least one component (1a) and said at least one other component (1b) of said data-processing system in order to communicate data by light among said at least one light source (2a), said at least one sensor (7a), said at least one other light source (2b) and said at least one other sensor (7b).

Regarding claim 7, the Examiner argued that Ozeki discloses (the Examiner cited FIG. 1) aligning said at least one component directly opposite said at least one other component in order to form at least one direct light path between said at least one light source (42a) and said at least one other sensor (42b) and said at least one other light source and said at least one light sensor.

The Applicant respectfully disagrees with this assessment and notes that the argument presented above against the rejections of claims 1 and 11 applies equally against the rejections of claims 2, 7 and 12, as these claims are dependent upon either claim 1 or claim 11. As argued above, Ozeki does not disclose a system wherein the light is transmitted *directly* from source to sensor or guided by *only* at least one mirror, as in the Applicant's claims.

Ozeki, therefore, fails in the aforementioned *prima facie* anticipation test as Ozeki does not disclose each and every limitation of the Applicant's claims. Based

on the foregoing, the Applicant respectfully requests that the 35 U.S.C. §102(b) rejections of claims 2, 7 and 12 based on the Ozeki reference be withdrawn.

IV. Claim Rejections - 35 USC § 103

Requirements for Prima Facie Obviousness

The obligation of the examiner to go forward and produce reasoning and evidence in support of obviousness is clearly defined at M.P.E.P. §2142:

"The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness."

The U.S. Supreme Court ruling of April 30, 2007 (*KSR Int'l v. Teleflex Inc.*) states:

"The TSM test captures a helpful insight: A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. Although common sense directs caution as to a patent application claiming as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the art to combine the elements as the new invention does."

"To facilitate review, this analysis should be made explicit."

The U.S. Supreme Court ruling states that it is important to identify a *reason* that would have prompted a person to combine the elements and to make that analysis *explicit*. MPEP §2143 sets out the further basic criteria to establish a *prima facie* case of obviousness:

1. a reasonable expectation of success; and
2. the teaching or suggestion of all the claim limitations by the prior art reference (or references when combined).

It follows that in the absence of such a *prima facie* showing of obviousness by the Examiner (assuming there are no objections or other grounds for rejection) and of a *prima facie* showing by the Examiner of a *reason* to combine the references, an applicant is entitled to grant of a patent. Thus, in order to support an obviousness rejection, the Examiner is obliged to produce evidence compelling a conclusion that the basic criterion has been met.

Orino in view of Ozeki

The Examiner rejected claims 16 and 18 under 35 U.S.C. §103(a) as being unpatentable over Orino et al. (U.S. Patent No. 5,530,577) hereinafter referred to as "Orino", in view of Ozeki.

Regarding claim 16, the Examiner argued that Orino discloses (the Examiner cited FIG. 1) a system comprising: at least one light source (2a) and at least one light sensor (7a) associated with at least one component; at least one other light source (2b) and at least one other light sensor (2b) associated with at least one other component, wherein data is communicated between said at least one component (1a) and said at least one other component (1b) of said data processing system by transmitting light from said at least one light source (2a) to said at least one other light sensor (7b) or from said at least one other light source to said at least one sensor (7a); at least one light path established between said at least one component and said at least one other component of said data-processing system in order to communicate data by light among said at least one light source, said at least one sensor, said at least one other light source and said at least one other sensor; and at least one mirror (4aa) located at the end of said at least one light path in order to guide light emitted directly from said at least one light source to said at least one mirror and thence directly to said at least one other light sensor and light emitted directly from said at least one other light source to said at least one mirror (4aa) and thence directly to said at least one light sensor.

The Examiner admitted that Orino does not teach the optical communication device (which includes 1a and 1b) are part of a data-processing system. The Examiner argued that Ozeki teaches optical communication devices to be implemented in a data-processing system (100). The Examiner argued that it would have been obvious to a person of ordinary skill in the art at the time of the invention to implement optical communication devices in a data-processing system to achieve compact design by eliminating the wires required.

Regarding claim 18, the Examiner argued that Orino discloses at least one component located perpendicular to said at least one other component in order to form a perpendicular light path between said at least one light source and said at least one other sensor and said at least one other light source and said at least one light sensor, wherein said perpendicular light path is guided by said at least one mirror (4aa).

The Applicant respectfully disagrees with this assessment and notes that the argument presented above against the rejection of claim 16 under §112 applies equally against the rejection under §103. As presented above, claim 16 includes the limitation wherein the light is emitted *directly* from a *source* to a *mirror* and thence *directly* to a *sensor*. This limitation is disclosed in the Applicant's FIG. 4 and in paragraph [0031] as shown above in the argument against claims 1 and 11.

Orino, on the other hand, includes several items on the light path from the light source to the sensor, for example (see Orino FIGS. 1-3), a lens group, a polarizing beam splitter, and a quarter-wave plate. This is disclosed in Orino col. 4, lines 45-55.

Therefore, Orino does not disclose that the Applicant's claim 16 limitation of at least one mirror located at an end of said at least one light path in order to guide light emitted *directly* from said at least one light source to said at least one mirror and thence *directly* to said at least one other light sensor and light emitted *directly* from said at least one other light source to said at least one mirror and thence

directly to said at least one light sensor. The Applicant reminds the Examiner that the definition of "directly" is point to point without any obstacles.

Orino in view of Ozeki fails in the aforementioned *prima facie* obviousness test as each and every limitation of the Applicants claims 16 and 18 is not disclosed. Based on the foregoing, the Applicant respectfully requests that the 35 U.S.C. §103(a) rejections of claims 16 and 18 based on the Orino and Ozeki references be withdrawn.

Orino in view of Ozeki/Kim

The Examiner rejected claims 19 and 20 under 35 U.S.C. §103(a) as being unpatentable over Orino in view of Ozeki further in view of Kim (U.S. Patent Publication No. 2002/0021855).

Regarding claim 19, the Examiner argued that Orino in view of Ozeki discloses the invention set forth above. The Examiner admitted that Orino in view of Ozeki does not teach the use of LED. The Examiner argued that Kim discloses the use of LED (the Examiner cited Kim col. 4, lines 50-55). The Examiner argued that it is well known to use LED as a light source. The Examiner argued that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use LED as a light source to improve the reliability of the light source.

Regarding claims 20, the Examiner argued that Orino in view of Ozeki discloses the invention set forth above. The Examiner admitted that Orino in view of Ozeki does not disclose the use of a VCSEL. The Examiner argued that Kim discloses the use of VCSEL (the Examiner cited Kim col. 4, lines 55-60). The Examiner argued that it is well known to use VCSEL. The Examiner argued that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use a VCSEL to increase the amount of signal to be sent within a given amount of time.

The Applicant respectfully disagrees with this assessment and notes that the argument presented above against the rejections of claim 16 applies equally

against the rejections of claims 19 and 20 as these claims are dependent upon claim 16.

As presented above, Orino in view of Ozeki does not disclose the limitation wherein at least one mirror located at an end of said at least one light path in order to guide light emitted *directly* from said at least one light source to said at least one mirror and thence *directly* to said at least one other light sensor and light emitted *directly* from said at least one other light source to said at least one mirror and thence *directly* to said at least one light sensor. The inclusion of the Kim reference does not disclose this limitation either.

Orino in view of Ozeki and further in view of Kim, therefore fails in the aforementioned *prima facie* obviousness test as each and every limitation of the Applicant's claims are not disclosed. Based on the foregoing, the Applicant respectfully requests that the 35 U.S.C. §103(a) rejections of claims 19 and 20 based on the Orino, Ozeki and Kim references be withdrawn.

V. Conclusion

In view of the foregoing discussion, the Applicant has responded to each and every rejection of the Official Action. The Applicant has clarified the structural distinctions of the present invention. Also, the amendments provided herein are presented for clarification purposes only. Applicant respectfully requests the withdrawal of the objections and the rejections under 35 U.S.C. §102, §103 and §112 based on the preceding remarks. Reconsideration and allowance of Applicant's application is also respectfully solicited.

Should there be any outstanding matters that need to be resolved, the Examiner is respectfully requested to contact the undersigned representative to conduct an interview in an effort to expedite prosecution in connection with the present application.

Respectfully submitted,



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